

REMARKS

Applicant thanks the Examiner for the thorough examination of the application. No new matter is believed to be added to the application by this Amendment.

Status of the Claims

Claims 1-4, 6-11, 14-21, 23 and 24 are pending in the application and stand rejected. Claims 5, 12, 13 and 22 are canceled by this amendment. The amendments to claim 1 incorporate the subject matter of canceled claim 5. The amendments to claim 12 incorporate the subject matter of canceled claims 12 and 13. The amendments to claim 21 incorporate the subject matter of canceled claim 22. The amendments to claims 1, 6, 14, and 21 clarify the language of the claims. Claim 14, 23 and 24 have been amended so as not to be dependent upon a canceled claim.

Objection to the Drawings

The drawings are objected to on the grounds that the cited feature "the planar surface of each convex portion has a circular shape" is not shown. However, the Examiner is directed to page 7, lines 8-10, of the specification, which describes how "the plane surface...of the convex portions can be varied among, e.g., a circular shape 527." Also, this feature is clearly set forth in

Figure 6a. Accordingly, withdrawal of the objection to the drawings is respectfully requested.

Rejection under 35 U.S.C. §112, second paragraph

Claims 1 and 21 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicant traverses these rejections and respectfully requests reconsideration and withdrawal thereof.

In the office action, the Examiner asserts that claims 1 and 21 have insufficient antecedent basis. The claims, as amended, are clear, definite and have full antecedent basis. Accordingly, this rejection is overcome and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §102(b) over Yoshikawa

Claims 1, 3, 4, 11, 18-22, and 24 are rejected as being anticipated by Yoshikawa et al. (JP 410172318A). Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

Yoshikawa fails to disclose an angle between the surfaces between 90° and 100°, as is defined in Figure 5 and claimed in original claims 5 and 13. While not acquiescing to this ground of rejection, claim 5 is canceled and its subject matter incorporated into independent claim 1. In addition, claims 12 and 13 are

canceled and their subject matter incorporated into independent claim 11. As a result, independent claims 1 and 11 contain subject matter that is not anticipated by Yoshikawa. Claims dependent upon independent claims 1 and 11 are patentable for at least the above reasons alone.

Accordingly, this rejection is overcome, and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §102(b) over Yamamoto

Claims 1, 2, 6, 9-11, and 18 are rejected under 35 U.S.C. §102(b) as being anticipated by Yamamoto (U.S. 5,341,231). Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

While not acquiescing to this ground of rejection, it is respectfully submitted that the amendments discussed above with respect to Yoshikawa, as well as the amendment of independent claim 10 to incorporate the 90 to 100° angle limitation, serve to overcome the rejection based on Yamamoto.

Accordingly, this rejection is overcome, and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §102(e) Over Miyashita

Claims 1, 2, 5-9, and 11-18 are rejected under 35 U.S.C. §102(e) as being anticipated by Miyashita (U.S. 6,264,343). Applicant traverses this rejection and respectfully requests reconsideration and withdrawal thereof.

Miyashita at, e.g., Figure 1, shows perpendicular protrusions 12 having an angle of 90°. Miyashita at column 3, lines 66-67 describes "faces substantially perpendicular to the emitting face." Miyashita fails to disclose "an angle between the lower surface and a surface connecting the planar surface of the convex portion is in a range of 90° to 100°," such as is set forth, for example, in independent claim 1 of the application. See also, instantly amended independent claim 11.

At page 6 of the Office Action, the Examiner asserts "According to claims 5 and 13 . . . would be obvious in a range of 90° to 100° (emphasis added)." However, obviousness-type reasoning is applicable to rejections under 35 U.S.C. §103 and not to anticipation rejections under 35 U.S.C. §102. See, e.g., MPEP 2143 et seq.

Yet further, even if it assumed *arguendo* that Miyashita can be used as the basis of a rejection for obviousness under 35 U.S.C. §103, the present invention shows unexpected advantages that can be

obtained when the claimed range of 90° to 100° range is used. These advantages include the ease of manufacture (versus a 90° configuration) discussed at page 5 of the specification.

Solely to expedite prosecution, independent claims 1 and 11 are amended as discussed above. In view of these amendments and the foregoing discussion, the rejection based on Miyashita is overcome, and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §102(e) over Shinji

Claims 1-5 and 11-24 are rejected under 35 U.S.C. §102(e) as being anticipated by Shinji (U.S. 6,259,854). Applicant traverses this rejection and requests reconsideration and withdrawal thereof.

Shinji describes a light guide having trapezoidal protrusions. Shinji fails to disclose, indeed teaches away from, a 90° to 100° angle range between surface and sides.

At page 7 of the Office Action, the Examiner asserts "According to claims 3, 19 and 22, a spacing between the convex portions decreases with increasing distance from the light source." However, Shinji at column 10, lines 39-467, describes a "density distribution of patterns" which is fundamentally different than the spacing set forth in the present invention.

At page 8 of the Office Action, the Examiner depends upon the teachings of Shinji at column 6, lines 60-62 pertaining to to an angle slope $\delta \geq 5^\circ$ to infer a range of 90° to 100° . However, this is part of a disadvantageous case where "scattering efficiency becomes low." See Shinji at column 6, lines 65-66. Further, Shinji teaches away from the 90° to 100° angle range of the invention at column 7, lines 34-36, which states "Accordingly a pattern having the trapezoidal slope angle $\delta=10$ to 30° is desirable to have large ray utility factor and to reduce loss."

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

To expedite prosecution, independent claims 1 and 11 are amended as discussed above, and claim 22 is cancelled, its subject matter being incorporated into independent claim 21. Accordingly, the rejection based on Shinji is overcome, and withdrawal thereof is proper.

Prior Art of Record

The prior art of record not relied upon by the Examiner shows the state of the conventional art, and not further discussion is necessary.

Information Disclosure Statement

Applicant thanks the Examiner for considering the Information Disclosure Statement filed May 18, 2001 and making the initialed PTO-1449 form of record in the application in the Office Action mailed January 4, 2002 (Paper No. 4).

The Examiner is respectfully requested to consider the Information Disclosure Statement filed September 22, 2000 and to make the initialed PTO-1449 form of record in the next Official Paper.

Correspondence

The Examiner is respectfully requested to send all correspondence in connection with this application to Joseph A. Kolasch (Reg. No. 22,463) at P. O. Box 747, Falls Church, VA 22040-0747.

Conclusion

If the Examiner has any questions concerning this application, he is invited to contact Robert Goozner, Ph.D. (Reg. No. 42,593), at (703) 205-8000 in an effort to expedite prosecution.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or to credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joseph A. Kolasch, #22,463

3430-105P
Attachment
JAK:REG:rk



P. O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 5, 12, 13, and 22 have been cancelled without prejudice or disclaimer.

Claims 1, 6, 10, 11, 14, 21, 23, and 24 have been amended as follows:

1. (Amended) An auxiliary light source device for a reflective liquid crystal display device having a reflector, the auxiliary light source device comprising:

a light source; and

a light directing member for directing incident light from the light source toward the reflector, the light directing member including,

a lower surface having a plurality of convex portions extending from the lower surface, each of the convex portions having a substantially planar surface which is substantially parallel to the lower surface, and an angle between the lower surface and a surface connecting the planar surface of the convex portion is in a range of 90° to 100°.

6. (Amended) The device according to claim 1, wherein the planar surface of each convex portion has a substantially circular shape.

10. (Amended) A reflective liquid crystal display device, comprising:

a display panel including two substrates spaced apart, liquid crystal sandwiched between the two substrates, and a reflector to reflect light through the liquid crystal; and

an auxiliary light source device for supplying light to the display panel, including,

a light source,

a light directing member for directing incident light from the light source toward the display panel, the directing member having a lower surface having a plurality of convex portions, each having a substantially planar surface which is substantially parallel to the lower surface, an angle between the lower surface and a surface connecting the planar surface of the convex portion being in a range of 90° to 100°, and

a light reflecting member which guides light from the light source into the light directing member.

11. (Amended) An auxiliary light source device for a reflective liquid crystal display device having a reflector, the auxiliary light source device comprising:

an upper reflective surface to reflect impinging light above a certain incidence angle;

a lower reflective surface having a plurality of convex portions extending toward the reflector to direct light from the auxiliary light source device to the reflector; and

an entry surface connecting the upper and lower reflective surfaces through which light from a light source enters, wherein each convex portion includes a planar portion and sides connecting the planar portion with the lower reflective surface, and an angle between the lower surface and the sides is in a range of 90° to 100°.

14. (Amended) The device according to claim [13] 11, wherein the planar portion is substantially parallel to the lower reflective surface.

21. (Amended) An auxiliary light source device for a reflective liquid crystal display device having a reflector, the auxiliary light source device comprising:

a light source extending along a width of the reflector, to emit light along a length of the reflector; and

a light directing device located above the reflector and adjacent to the light source to direct light from the light source to the reflector such that a light distribution of [the directed] light directed by the light directing device is substantially uniform along the length of the reflector, and such that the directed light is substantially perpendicular to the reflector, and the light directing device includes a plurality of portions extending toward the reflector, a spacing between the portions decreasing along the length of the reflector with increasing distance from the light source.

23. (Amended) The device according to claim [22] 21, wherein the spacing between adjacent portions is in a range of 10 μ m to 1000 μ m and a width of each portion is less than 100 μ m.

24. (Amended) The device according to claim [22] 21, wherein each of the plurality of portions includes a planar surface parallel to a lower surface of the light directing device and connected to the lower surface by at least one side oriented substantially perpendicular to the lower surface.